Opportunity Analysis for Maps & Charts

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Revision #: 1 (FINAL)
Date: 8 January 2002

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1. DOCUMENT ACCEPTANCE

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2. Record of Changes

The following serves as a history of the change activity affecting this document:

Change Number	Date	Number Of Figure, Table Or Paragraph	A* M D	Title Or Brief Description
Rev 0	12/14/01			First draft
Rev 1	1/8/02	Various	M	Incorporates comments received from CPF

*__A__ - Added __M__ - Modified __D__ - Deleted

3. Executive Summary

This report documents the results of an Opportunity Analysis (OA) performed on the Maps & Charts pilot project, also referred to throughout this document as the Geospatial Information and Services Allowances System (GI&SAS), by the DoN eBusiness Operations Office. This analysis consists of the following major components:

- A review of the project's background, the system's capabilities, and the business problem addressed by the pilot
- An assessment of the pilot's results using a unique metrics specifically developed to determine project success, and documentation of the lessons learned during system planning, development and execution
- A roadmap for the future, including the identification of additional business opportunities, discussion of implementation considerations, and recommendations relative to potential system enhancements

Currently, the Defense Logistics Agency (DLA) manages over 65,000 unique geospatial products, in over 250 different categories ranging from harbor maps to approach maps, and scores of others. Depending upon mission, the average Navy ship has over 10,000 of these maps and charts on board, most with multiple copies. Aircraft carriers typically deploy with the equivalent of over 60,000 pages of such documentation. The allowance process now in place to establish and control inventory levels for these products is manual, labor intensive, and unresponsive to rapidly changing operational requirements. The current allowance review cycle exceeds 120 days, and once inventory requirements have been determined, there is no centralized database from which to access this information. Thus Fleet units have no ready visibility of what maps are authorized in their basic load, or what maps are, in fact, on board at any given time.

The GI&SAS prototype is a dynamic web-based database application designed to enable Fleet Commanders in Chief (CINCs), Numbered Fleet Commanders (NFCs), Type Commanders (TYCOMs), individual Fleet units, and DLA to view and manage allowances for maps, charts, and other geospatial products required for navigation, training, and operations. With sponsorship from the Navy's eBusiness Office, CINCPACFLT (CPF) Code N65 developed the GI&SAS system in order to streamline the GI&S unit load allowance process and provide timely access to allowance information. Reengineering the current business process was an integral part of the pilot. The organizational chart for the pilot is attached as **Appendix A**. CPF worked closely with CINCLANTFLT (CLF) and DLA to develop a single operating procedure and provide allowance requirements to Defense Supply Center – Richmond (DSC-R), the DoD inventory control point (ICP) for geospatial products, in a useful mechanized format. This pilot represents the first step toward developing a "G&IS COSAL", and provides a browser-based tool for establishing map allowances, supported by internal email communications and a Microsoft SQL Server database, accessible by all authorized system users.

Application development was completed in September 2001, followed immediately by testing and pilot execution in October. A group of geographically dispersed users participated in the pilot, which, according to all established metrics, successfully demonstrated the system's capability to dramatically streamline the allowance determination process for GI&S products.

Most significantly, the prototype test results indicated that the timeline for creating a unit (ship) allowance could be reduced from 120 days to five days, and the level of effort associated with this task was reduced from 270 man-hours to 20 man-hours. During the course of the project, the previously unique business processes for CPF and CLF were consolidated into a single, more efficient workflow. At the conclusion of the pilot, the allowance requirements were transmitted to DSC-R in a mechanized format, validating the potential for additional efficiencies on their end as well.

Figure 1 summarizes the actual GI&SAS system development and projected life cycle maintenance costs, along with the estimated productivity savings that should be anticipated based upon the results experienced during the pilot. Implementation of the system would produce immediate payback and full recovery of development costs in FY02, providing a return on investment (ROI) ratio of 4 to 1. Steady state annual productivity savings are estimated to be roughly $4.4M in the out-years.

	FY02	FY03	FY04	FY05
Annual Gross Productivity Savings	$2,187,500	$4,375,000	$4,375,000	$4,375,000
Cumulative Gross Productivity Savings	$2,187,500	$6,562,500	$10,937,500	$15,312,500
Cumulative System Costs	$501,202	$551,202	$601,202	$651,202
Cumulative Net Cash Flow (Gross Savings – Costs)	**$1,686,298**	**$6,011,298**	**$10,336,298**	**$14,661,298**
Return on Investment (ROI)	**4 to 1**	**12 to 1**	**18 to 1**	**23 to 1**

Figure 1: Cost/Benefit Summary

The GI&SAS system has clear applicability in the Coast Guard, Military Sealift Command (MSC), Marine Corps, and virtually any DoD organization engaged in building allowance documents for deployed units. Having been an active participant in the development of this pilot, the system and associated business process has also been enthusiastically supported by DLA. However, users participating in the prototype test identified several recommended changes and enhancements that will have to be incorporated before GI&SAS can be fully implemented in a production environment. The cost associated with performing these program modifications, as estimated by CPF, is $150K, and will take four months to complete. Given the significant value potential afforded to the enterprise by GI&SAS, with minimal additional investment, it is highly recommended that funding sponsorship for the remaining system enhancements be identified as soon as possible. Further details relative to the project's scope, benefits, results, and future are discussed throughout the remainder of this document.

4. Project Description and Background

Geospatial products are free issue and relatively low in cost, when compared to the substantial up-front investment and logistics infrastructure required for life cycle support of the multi-million dollar weapons systems in today's Navy. For example, the basic map load for an aircraft carrier has a $75,000 price tag. However, the resources required to manage these publications, and their importance to navigational safety, mission performance, and readiness is far from trivial. The GI&SAS prototype is a web-based system designed to enhance operational readiness through business process re-engineering and development of a centralized GI&S management tool and database.

4.1 Business Problem Satisfied by the Pilot

The current allowance process for map products is entirely manual and takes over 120 days to complete. In addition, there is no database containing allowance information, and no way for a ship, or the command structure, to have visibility of the range or quantity of geospatial products authorized on board each unit. These deficiencies impair the Fleet's ability execute assigned mission taskings, and potentially jeopardize navigational safety. Compounding these problems is the fact that CPF and CLF each have their own unique business process for managing GI&S requirements.

4.2 Current System or Process

Basic allowances for Fleet maps, charts and geospatial information are administered by CPF, CLF, the Numbered Fleet Commanders, and the TYCOMs using hardcopy instructions that are difficult to interpret, and virtually impossible to update in a timely manner in response to changing operational requirements. As shown in **Figure 2**, the CINC initiates the allowance review cycle by sending a written request for requirements analysis to the Fleet Commanders and TYCOMs. These organizations, in turn, forward the allowance instruction to the applicable subordinate units (ships or shore activities) for their input. This portion of the process takes about 60 days. The CINC then consolidates all allowance change recommendations when received, and returns the updated instruction to the same groups for a second review, which takes another month. Upon receipt of the final comments, the CINC formally publishes the new allowance instruction and passes the requirements to DSC-R, via official written correspondence.

The entire process and flow of information, shown in **Figure 3**, consumes four months on the calendar. Further, documentation of the unit's allowances is resident only on the hard copy documents that have been iteratively mailed back and forth among the participants. For all intents and purposes, this valuable business intelligence information is lost, buried in numerous desk drawers and file cabinets throughout the world.

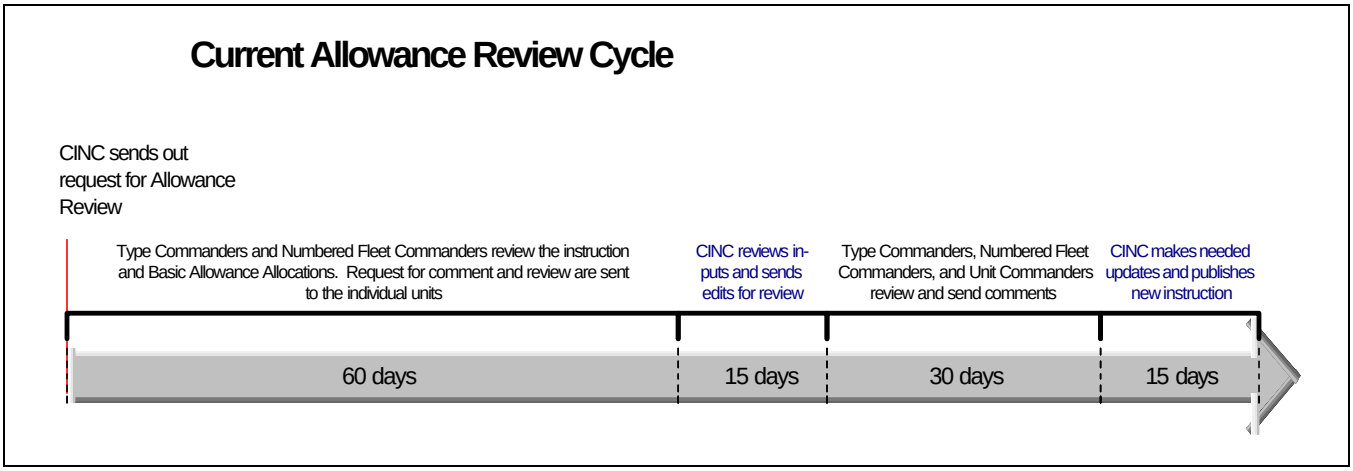


Figure 2: Current Business Process Timeline

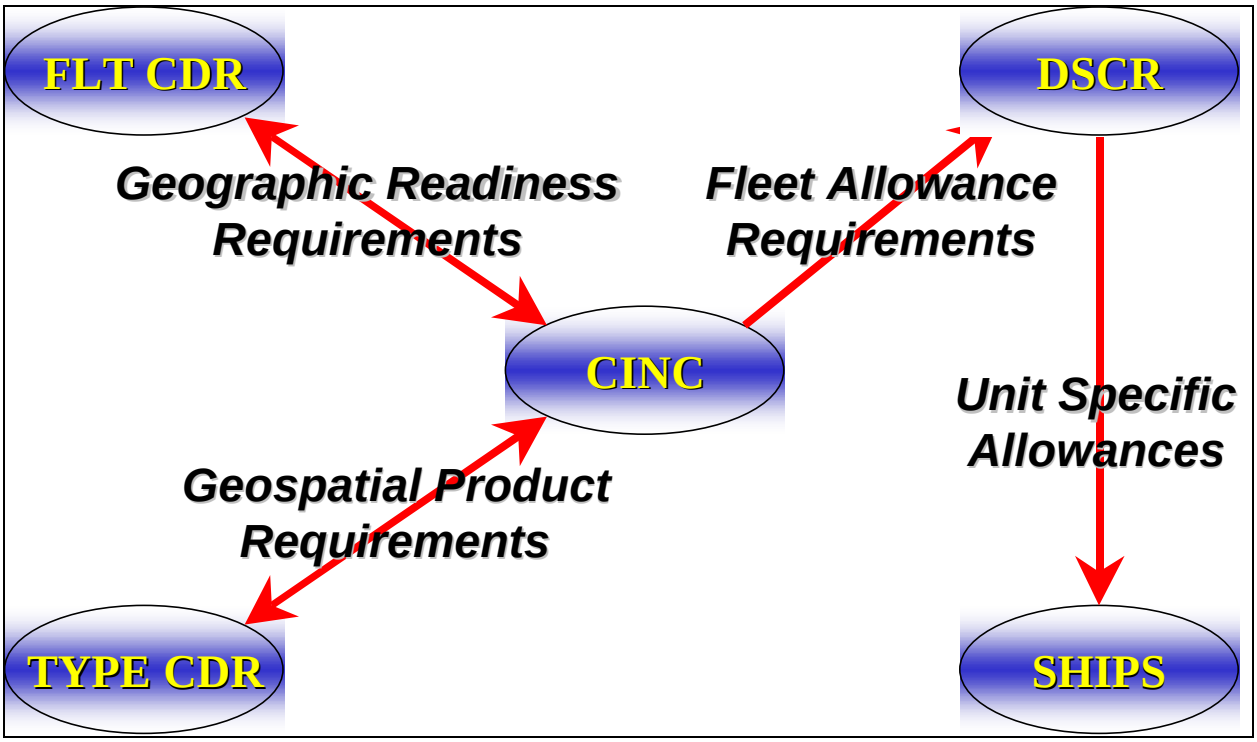


Figure 3: Current Business Information Flow

The instruction and administration methodology has evolved over time into two distinct procedures. While CINCLANTFLT uses a deployment packet method, CINCPACFLT employs a method based upon mission tasking. The CINCLANTFLT process results in allowance packages that are heavily driven by, and focused on, the specific areas planned for the ship during its deployment. CINCPACFLT's current methodology allows broad area coverage based upon the AOR (Area of Responsibility) assigned to the ship by the numbered fleet commander. Changes to these basic allowance loads are made on an "as needed" basis, with no regular schedule or evaluation period.

Any basic allowance changes must be passed to DLA via official correspondence (classified e-mail, NAVMSG, or Naval letter) and signed by an individual with signature authority. It should be emphasized that these requirements are not transmitted in an automated format, and must be manually entered into the system by DLA. According to the current agreement between DLA and the Navy, updates to the basic allowances are performed annually, with the revisions published in an official instruction. There is no consistent or viable means of managing this process from an enterprise or Navy-wide perspective, and no historical record of Fleet allowances.

Problems with the current allowance system include:

- Paper allowance instructions (coordinated through the mail)
- No DoN business process standardization (CPF and CLF operate under different policies and procedures)
- Legacy software at DLA/DSC-R (requirements are manually entered into the DLA system from the hard copy allowance instructions)
- Allowance quantities cannot be tailored to meet specific operational taskings or

readiness levels (map quantities are the same for training or combat missions)

- No online database capability (current allowance information not visible at any functional level)
- Unable to view or manage basic allowances from different functional levels
- Unable to view or manage allowances in timely manner

The primary users of the system include the Fleet CINCs (CPF and CLF), Fleet Commanders, and Type Commanders. Secondary users are the Navy's operational units and the Defense Supply Center – Richmond.

4.3 Description of Pilot System

GI&SAS is a browser based management tool that centralizes information on the Fleet's basic unit load allowances for geospatial products required for navigation, training, mission execution. It provides allowance information to the Defense Logistics Agency in a useful format, and enables CINCPACFLT's Numbered Fleet Commanders and Type Commanders to view and manage unit allowances in order to improve GI&S readiness planning and operational responsiveness. The prototype application is accessible from the classified SIPRNET (Secret Internet Protocol Router Network) network only.

GI&SAS leverages the internet's inherent capability to connect geographically dispersed users and streamline communications, while providing these users with a real-time view of critical business information that was previously inaccessible. One of the key principles employed in the system's design was simplicity. Whenever possible, the developers integrated commercial off the shelf (COTS) functionality, rather than attempting to build it from scratch. For example, instead of hard coding a static range of management reports, the application provides authorized users with the capability to extract data from the database in Microsoft Excel format, download the information to their PC, and manipulate the data as required to meet their individual needs.

GI&SAS supports an improved business process that allocates specific work tasks and responsibilities among several types of users or roles. It should be noted that while the prototype assigns these roles to the CINCs, NFCs, TYCOMs, and operational units, the flexible nature of the system's design will allow the application administrator to assign roles in any manner that the implementing organization requires, making the application easily exportable throughout DoD. GI&SAS utilizes email to generate notifications to other system users when work items have been completed, thus reducing delays in the flow of information and providing accountability. **Figure 4** presents a graphical overview of the improved business information flow and the interaction between the various user roles described below.

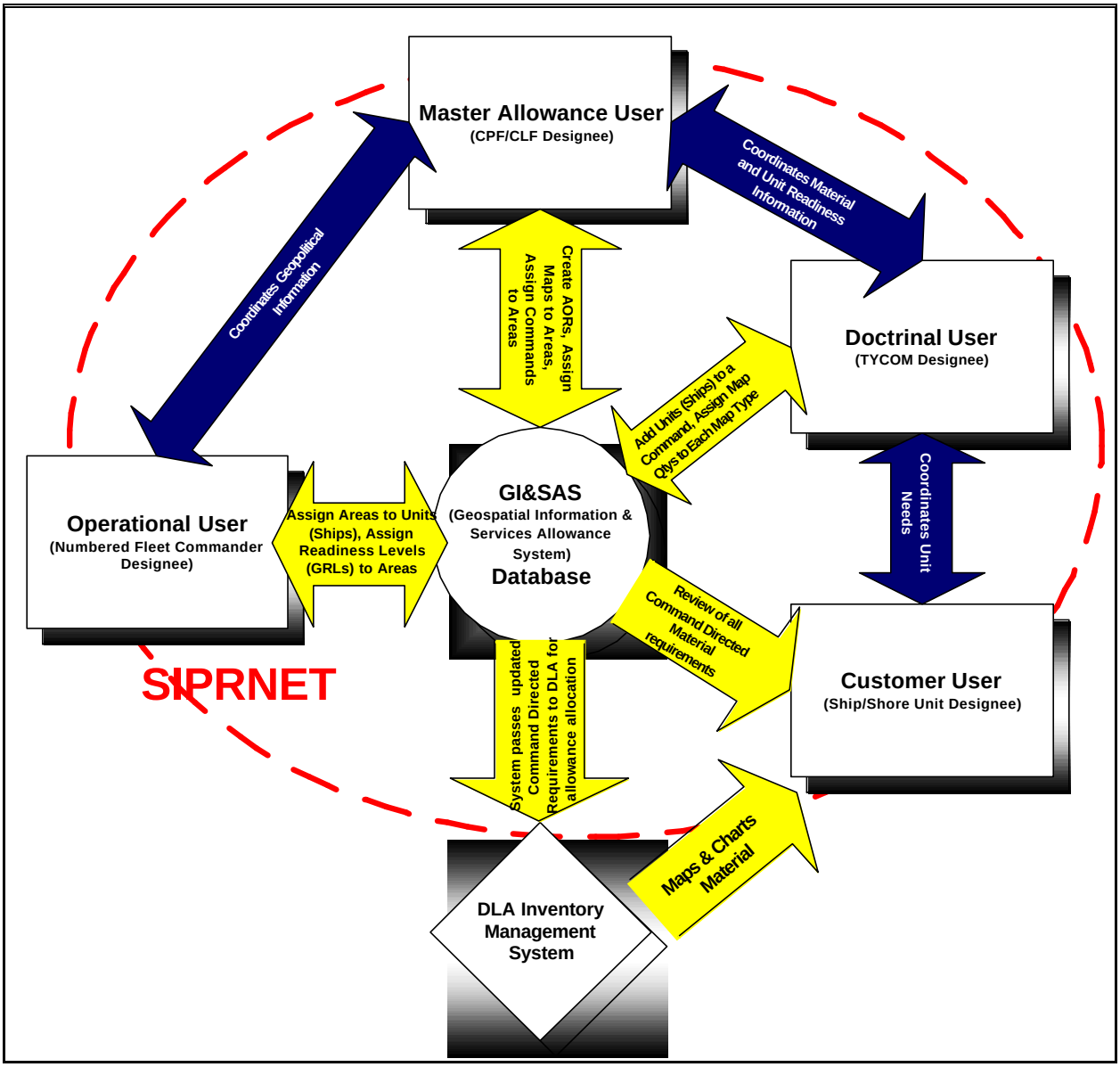


Figure 4: GI&SAS Business Information Flow

4.3.1 Application Administrator Role

The application administrator's primary responsibility is to add new branches (i.e., Navy, Marines, or other) and maintain the user types in the system. The branch defines the role hierarchy, type codes (i.e., ship types), GRLs (Geospatial Readiness Levels), and top-level commands to be used within the system. A configuration wizard walks the administrator through the branch addition process. The application administrator has no access to other data within the system.

4.3.2 Master Allowance User Role

The Fleet CINCs (GIS Officers) have been assigned the role of master allowance user (MAU). This role is charged with creating geographical areas of responsibility (AORs), such as Korea, or Afghanistan, and assigning the requisite

types of maps to those areas. In other words, these users build the lists of maps that correspond to a given operational area. This process is significantly enhanced by the ability to upload lists of maps from the user's desktop in MS Excel format. The MAU also adds operational and doctrinal users to the system and assigns AORs to an operational command, such as the Commander, U.S. 7th Fleet.

4.3.3 Operational User Role

The Numbered Fleet Commanders, as operational users, are responsible for assigning GRLs to the geographic areas under their purview, and assigning specific units (ships) to those areas. GRLs are numeric indicators, ranging from "1" to "8", that equate to a level of readiness. For example, a GRL of "1" may be assigned to indicate a navigation and training mission, a "3" for low intensity operations, or "6" for high intensity operations. Default GRLs are initially assigned to all maps for a geographic area, but the system provides the capability to override the readiness levels for specific units assigned to that area. This process is further automated by a function that allows the operational user to "clone" the area assignments from one unit to another, reducing the amount of manual input required. The GRL definitions are flexible, and may be configured at the time of system installation to conform to policy of the implementing organization.

4.3.4 Doctrinal User Role

This role, executed by the TYCOMs, consists of adding new units to the system, making them available to the operational user for assignment to an AOR, and determining the material readiness needs (specific map quantities) for these units. Once these requirements have been determined, the end result is a matrix consisting of GRLs and associated quantities for each type of map. Doctrinal users are aided by a system function that permits "cloning" map type quantities from one unit to another, thus providing the equivalent of templates that can be modified on an exception basis rather than building each unit allowance profile from scratch.

4.3.5 Unit User Role

Shipboard personnel are assigned the unit user role. These users may now view their on-board map allowances and generate reports in order to respond readiness questions, significant capabilities not currently available to them. The reporting function is available to all authorized users. While unit users do not have the ability to modify the authorized map allowance quantities, they may offer recommended changes to their TYCOMs (doctrinal users) via the system's internal email capability.

The net result from the implementation of this reengineered and web-enabled business process is the dramatic reduction in GI&S allowance cycle review time from 120 days to five days, as depicted in **Figure 5**. The process concludes with production of an allowance requirements file that is extracted from the SQL Server database hosted on the SIPRNET. This file is manually transferred (via "sneaker net") to a server on the NIPRNET (Unclassified N-level Internet Protocol Router Network by the master allowance user and transmitted by FTP (File Transfer Protocol) to DSC-R on a weekly,

or other negotiated frequency, basis.

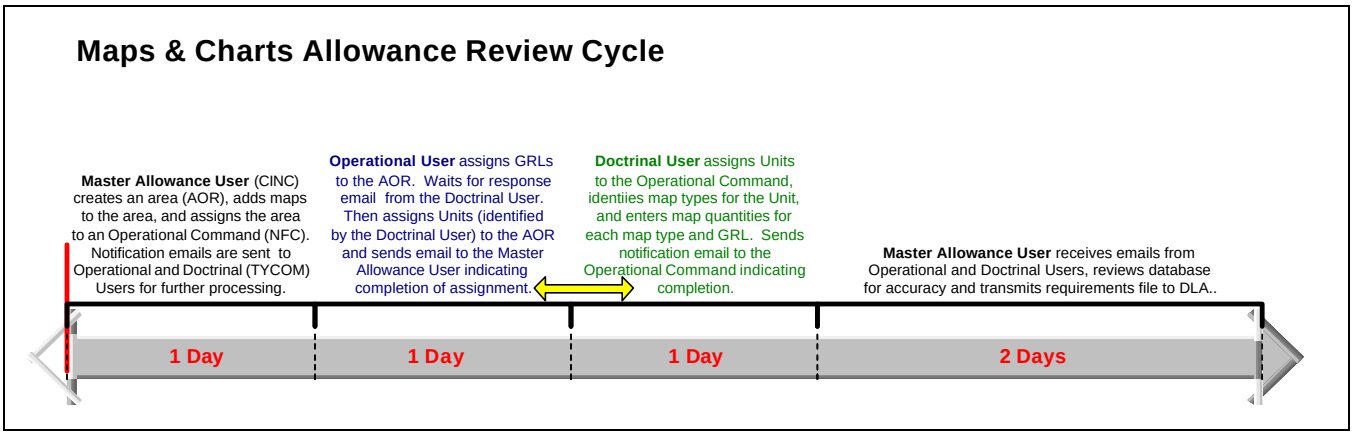


Figure 5: GI&SAS Business Process Timeline

4.4 Technical Architecture

The GI&SAS prototype is a web-based application developed using active server pages (ASP), XML (Extensible Markup Language), and a Microsoft SQL Server database running on the SIPRNET backbone. Access to the system is further controlled by the assignment of user IDs and passwords subject to Microsoft NT security authentication. Specific system components and requirements are shown below in **Figure 6**.

Server and Network Requirements	Windows NT Server 4.0 or higher
	MS SQL Server 7.0 or higher
	MS Internet Information Server 4.0 or higher
	IE5.5 SP2 or the following two components: – MS XML Parser 3.0 – VB Scripting Engine v5
	HashPwd.dll
	SIPRNET
Client Workstation Requirements	Microsoft NT Workstation 4.0 or higher
	Microsoft Internet Explorer 5 or higher – Client-side VBScript enabled – With cookies enabled
	Microsoft Office 2000 or higher
Languages/Development Tools Used	Hypertext Markup Language (HTML)
	Dynamic Hypertext Markup Language (DHTML)
	Active Server Pages (ASP)
	AppZilla (an ASP code generator)
	VBScript and JavaScript

Figure 6: GI&SAS System Components

Additional details relative to the technical system architecture are provided in **Appendix**

B (GI&SAS Website Map), **Appendix C** (GI&SAS Sample Screenshots), **Appendix D** (GI&SAS Database Diagram), and **Appendix E** (DLA GI&S Requirements File Layout).

5. Project Goals, Objectives and Metrics

5.1 Project Goals and Objectives

The overarching goal and primary business case for development of the GI&SAS prototype was to Improve geospatial readiness and the ability to respond to emergent taskings. Secondary, but related goals, included consolidation of the CPF and CLF allowance policies into a single standard process, transmission of allowance requirements to DLA in a mechanized format, and improving customer satisfaction.

5.2 Project Metrics

Seven metrics were established to measure the success of the pilot in attaining the goals mentioned above. Four indicators were used to assess the system's ability to improve geospatial readiness. The key quantitative indicator in this group is the overall time required to create or change an allowance, measured in calendar days. The other metrics related to this goal included the number of man-hours required to create or change an allowance, the time required to respond to readiness questions, and successful development of the GI&SAS prototype system. Standardization of the GI&S allowance business process would be achieved based upon the development of a joint CPF/CLF operating instruction that also met the needs of DLA. The ability of the Navy to communicate its geospatial allowance requirements in a mechanized fashion was assessed based upon the successful transmission of an allowance requirements file from a CPF server to a DSC-R server. Finally, the level of customer satisfaction with both the GI&SAS system and the related business process was measured through a user survey completed by each of the pilot participants.

5.3 Alignment of Pilot and Enterprise Goals

The alignment table shown in **Figure 7** demonstrates how the enhanced capabilities offered by the GI&SAS system directly contribute to the satisfaction of enterprise goals and objectives.

Enterprise Goals & Objectives (Critical Success Factor)	Pilot-Enabled Capability	Key Performance Indicators (Metrics)
Improve geospatial readiness and the ability to respond to emergent taskings	Reduction of allowance review cycle timeline	96% reduction in the ***Time Required to Create or Change an Allowance*** (**GOAL:** 5 calendar days compared to 120 days)
	Ability to tailor allowances to specific units and/or operational taskings	
	Reduction of man-hours to complete the allowance change cycle	94% reduction in the ***Effort Required to Create or Change and Allowance*** (**GOAL:** 15 man-hours compared to 270 man-hours)

Enterprise Goals & Objectives (Critical Success Factor)	Pilot-Enabled Capability	Key Performance Indicators (Metrics)
	CINCs, Fleet Commanders and TYCOMs are able to view and modify allowances on-line	90% reduction in the ***Time Required to Answer Readiness Questions*** (via readiness reports) (**GOAL:** 4 hours compared to 1 week)
	Operational Units are able to view their allowance data and recommend changes on-line	
	Information can be extracted for reporting purposes	
	On-line access to GI&S allowance information by a wider audience	***Develop a Web-based System Prototype*** (**GOAL**: Access by disparate geographic users)
Standardize the GI&S allowance business process across the Navy	Common reengineered business process for CPF, CLF and DLA	***Publish Joint CPF & CLF GI&S Operating Procedure*** (**GOAL**: Eliminate duplicate business processes)
Provide allowance information to DLA in a useable/mechanized format	Production of a formatted allowance output file for FTP (file transfer protocol) to DSC-Richmond	***Transmit Allowance Requirements File from CPF to DSC-R*** (**GOAL**: Replace hard copy instructions)
Improve customer satisfaction	Improved ease of use, enhanced communications capability (email), and reduction of administrative burden	Pilot User ***Customer Satisfaction*** Survey (**GOAL**: 90% Satisfaction rate)

Figure 7: Goal Alignment Table

6. Analysis of Pilot Results

6.1 Evaluation of Metrics

This section of the Opportunity Analysis presents an assessment of the success, or failure, of the GI&SAS pilot project in attaining its established goals.

6.1.1 Time Required to Create or Change an Allowance

Driving down the overall allowance review cycle time from the current average level of 120 days was the primary impetus for development of the GI&SAS system. Failure to accomplish the goal would severely jeopardize the project's odds of being viewed as successful. The target of five business days to complete the process was realized during the pilot period. The five-day timeline generally consisted of the following sub-processes:

- One day for the MAU to create an AOR, add maps to the area, assign the area to an operational user, and send notification emails
- Two days for the operational and doctrinal users to simultaneously perform their processing
- Two days for the MAU to review the final results and transmit an output file to DSC-R

6.1.2 Effort Required to Create or Change an Allowance

Creating or changing a geospatial allowance in today's completely manual environment requires roughly 270 man-hours. The goal of the Maps & Charts pilot was to reduce this labor requirement to 15 man-hours. Actual observations recorded during the test period yielded a total actual processing time of 19.6 man-hours. This total was composed of 17.5 man-hours to complete the work tasks assigned to the master allowance user role, .35 man-hours for the operational user role, and 1.75 man-hours for the doctrinal user role. Though the target level of 15 man-hours was not achieved, the results clearly produce significant savings. Additionally, it should be noted that a large portion of the 17.5 man-hour effort associated with the MAU was expended in order to conduct a comprehensive review of the pilot data quality. This level of effort would most likely not be required under normal, steady state operating conditions.

6.1.3 Time Required to Answer Readiness Questions

This indicator was measured in terms of the time required to extract the necessary information from the SQL Server database using the application's native report generation capability. Given the current lack of allowance database availability, it takes roughly a week to perform the manual research necessary in order to respond to routine geospatial readiness inquiries. Using the GI&SAS reporting capabilities during the pilot, testers were able to perform a full array of queries and generate formatted report output with elapsed times ranging between 45 seconds and 5 minutes per attempt. Even allowing for additional time to prepare supplemental correspondence, this level of responsiveness exceeded the established target of four hours.

6.1.4 Development of a Web-based System Prototype

The Maps & Charts pilot was conducted from 10/1/01 through 10/12/01 in accordance with the schedule established by the project plan. Test scripts designed to exercise the full range of system functionality for each of the assigned user roles were successfully executed to completion by a group of geographically dispersed participants. Despite the identification of several code recommended changes and a range of desired system enhancements by the testers, the prototype performed as intended, and validated the capability of making GI&S allowance information readily available throughout the enterprise. The utility of the application was confirmed through the results of a user survey conducted following completion of the pilot test period (discussed further in paragraph 6.1.7).

6.1.5 Development of Joint CPF and CLF Operating Procedure

The CPF functional lead worked closely with his counterpart at CLF, staff from

the various Numbered Fleet Commanders and TYCOMs, and personnel from DSC-R to create a single uniform business process from the two unique methodologies currently in place. A draft joint CPF/CLF operating policy for "Management of the GIS&AS Program", reflecting the roles and functionality made available through the GI&SAS system, was staffed and received tentative approval from all affected organizations. Upon full Navy-wide production implementation of the system, this instruction will become official policy.

6.1.6 Transmission of Allowance Requirements File to DSC-R

Following completion of the pilot period, the Maps & Charts team successfully demonstrated the ability to electronically transmit an allowance requirements file from CPF to DSC-R. The output was produced by the system from an overnight batch process, and sent to DLA in the expected format. The record layout for this output file is provided in **Appendix E**.

6.1.7 Customer Satisfaction

The five pilot participants each completed a thirteen-question user survey designed to measure their degree of satisfaction with the system and identify possible areas of improvement. The questions addressed areas such as overall impression of the functionality, ease of use, page navigation, system features, the user manual, and quality of the training received. 69% of the total responses were positive, and another 25% rated the system favorably, provided that minor modifications were implemented. Only 6% of the responses indicated that major system changes were required. The most favorably viewed aspects of the prototype were ease of access, the intuitive design and flow of the web pages, the User Guide, and the quality of the training provided. The target for this metric was 90% customer satisfaction. While the actual results of the pilot survey indicated a 69% positive rating, the satisfaction level could be quickly increased to 94% with the integration of a few minor programming changes. A more detailed summary of the user survey results has been included in **Appendix F**.

The radar chart shown in **Figure 8** summarizes the overall results of the pilot, in terms of the recorded metrics. This graphic plots each of the seven Maps & Charts project metrics along an axis with values ranging from a low of "0" to a high of "5". A value of "0" indicates that the applicable goal was not achieved, while a value of "5" represents a goal that was fully attained. Intermediate scores portray a range of performance between the two extremes, with values of "3" and above generally being indicative of success. Five of the seven Maps & Charts metrics targets were fully attained, including the critical allowance review cycle time, with the remaining two indicators, while showing success, falling slightly short.

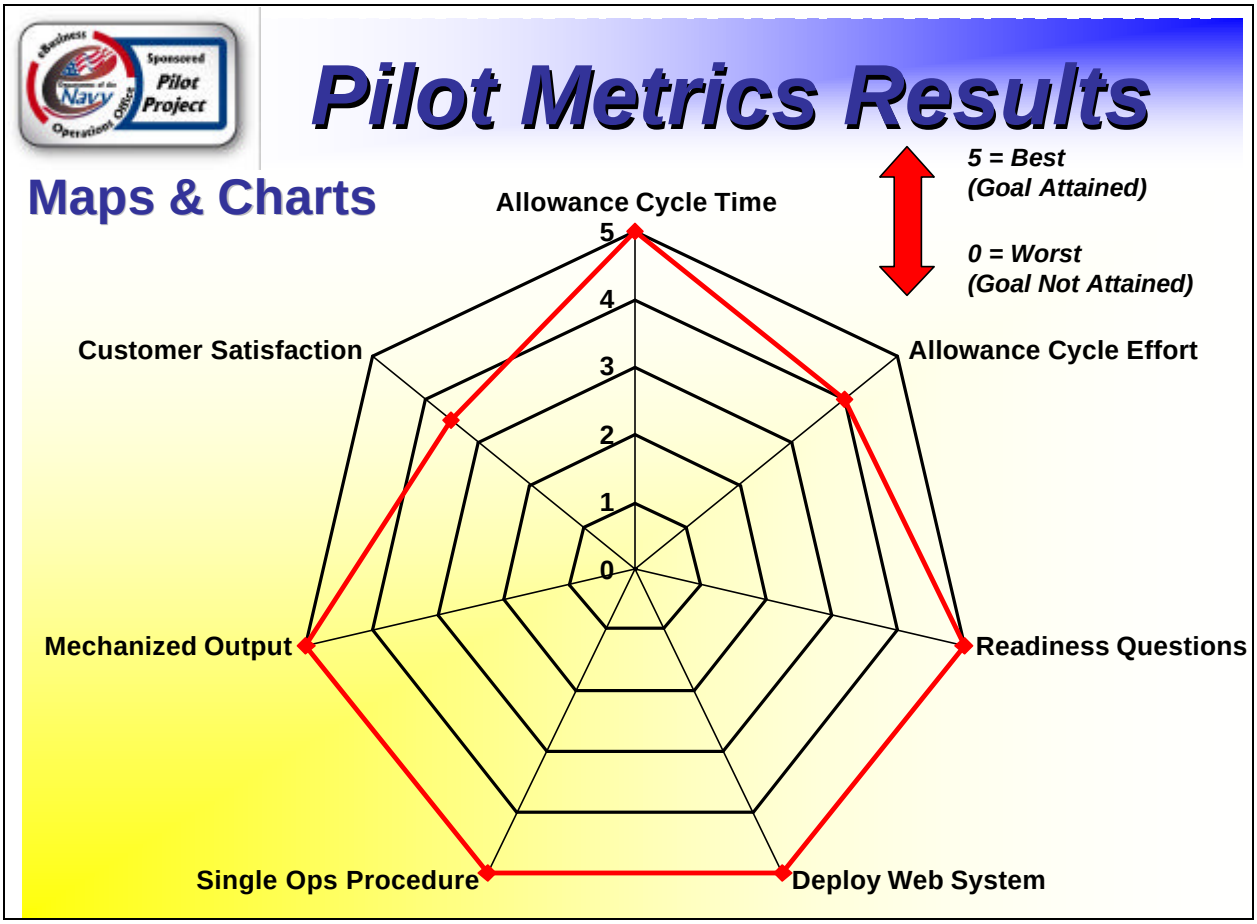


Figure 8: Maps & Charts Metrics Results Summary

6.2 Qualitative Analysis and Intangible Benefits

In addition to the metrics described above, the GI&SAS prototype produces several other less quantifiable, yet significant benefits for both the customer and the enterprise. These include:

- Fewer items requisitioned – Due to a lack of GI&S allowance visibility, current common practice is to requisition a complete map load prior to deployment, rather than just the delta between what's onboard and what's needed. GI&SAS provides the level of visibility necessary to permit requisitioning of only those maps required by the deploying unit.
- Less waste – Similar to the scenario noted above, the DLA subscription process automatically "pushes" map updates to all registered users. These users may, or may not, actually require these products due to changing AORs and mission assignments. In some cases this push methodology also results in duplicate maps being onboard. GI&SAS allows units to "pull" their specific requirements based on AOR, ship type and GRL, allowing maps to be treated more like items of supply. Also, geospatial products are now routinely destroyed during overhauls because it has been easier to take on an entire new load, rather than determine which maps to keep and which to discard. Under the new system, this wasteful practice will be discontinued.

- Won't send back needed maps – In the past deploying units have sometimes refused to accept shipments of geospatial products because they "didn't order them". This is another byproduct of the subscription/push process, which will be rectified through the use of the GI&SAS system.
- Onboard storage requirements reduced – The lack of storage space, particularly on submarines is a significant problem. GI&SAS provides the capability for ships to deploy with only those maps required to perform their assigned missions.
- Ability to build allowance templates – The "cloning" functionality supported by the system allows authorized users to develop standard profiles based upon ship type and/or AOR, which can then be used as the basis for building allowances for similar units or geographic areas, rather than constructing them from scratch. This significantly reduces the amount of manual effort required.
- Increased participation leads to better requirements identification – Making the GI&S allowance determination process and data available to a wider audience increases the probability that the right products will be at the right place at the right time.
- Enhanced safety of navigation – GI&SAS facilitates better version control, helping to ensure that deployed units have the most current maps available, minimizing the risk of friendly fire and navigational errors.
- Automated metrics – Web-based applications provide the ability to easily track system utilization, processing times and customer feedback.
- Leverages the use of other COTS tools – GI&SAS was built to support only the core range of business functions associated with GI&S allowance process management. The system easily integrates with common desktop applications, such as Microsoft Excel or reporting tools, to provide complimentary capabilities, and promote adoption of the prototype beyond the Navy.
- Big savings for DLA – Allowance requirements will now be conveyed to DLA in a mechanized format, eliminating the need to manually enter data into their system from the hard copy documentation currently being provided.
- No NMCI (Navy Marine Corps Intranet) impact – Since GI&SAS is a web-based solution, the only client side software required is a browser.
- Support of WEN (Web Enabled Navy) goals – The GI&SAS technical architecture and use of XML conforms to the Navy's WEN model.
- Establishes a foundation for future - GI&SAS provides a modern baseline platform capable of supporting future initiatives to enhance the Navy's ability to effectively manage geospatial products.

6.3 Cost-Benefit Analysis and ROI

The costs associated with GI&SAS system development and life cycle support are documented in **Figure 9** below. Total non-recurring development costs for enterprise-wide Navy rollout are projected to total $500K. This amount consists of $350K originally provided to CPF by the Navy eBusiness Office in FY01 to develop the prototype, and an additional $150K (as yet unfunded) to fund essential system modifications identified by users during execution of the pilot in October 2001. It should be noted that these enhancements must be incorporated into the current baseline prototype system before it

can be implemented in a Navy-wide production environment. A detailed list of the recommended changes and enhancements is provided in **Appendix G**. CPF estimates that it will take approximately four months to implement these changes once a supplemental funding source has been identified.

Annual recurring costs for system maintenance and operation are estimated to be roughly $50K for each year the system remains in operation. The pilot was hosted on CPF's existing NT server environment at no additional cost. The production version of the system, should it be implemented, would utilize these same (existing) hardware resources.

Description	FY01	FY02	FY03	FY04	FY05	TOTAL
Cost of Pilot System						
Hardware	$0	$0	$0	$0	$0	$0
Labor						
Project Manager	$75,087	$28,459				$103,546
Business Analyst	$35,818	$17,787				$53,605
ASP Developer	$52,574	$23,000				$75,574
Database Developer	$44,285	$23,000				$67,285
Network Engineer	$4,738	$2,464				$7,202
Information Assurance	$7,208	$2,148				$9,356
Application & Integration Testing	$15,235	$21,344				$36,579
ASP/VBA/XML Developer	$67,200	$23,000				$90,200
Functional Expert	$47,856	$10,000				$57,856
Subtotal Labor	$350,000	$151,202	$0	$0	$0	$501,202
Software	$0	$0	$0	$0	$0	$0
Subtotal Non-Recurring Costs	***$350,000***	***$151,202***	***$0***	***$0***	***$0***	***$501,202***
Recurring System Life Cycle Maintenance, Operations & Support (Projected)	$0	$0	$50,000	$50,000	$50,000	$150,000
Total Annual Pilot System Costs	**$350,000**	**$151,202**	**$50,000**	**$50,000**	**$50,000**	**$651,202**
Cumulative System Costs	**$350,000**	**$501,202**	**$551,202**	**$601,202**	**$651,202**	**$651,202**

Figure 9: Summary of Development & Support Costs

Figure 10 compares GI&SAS system development and life cycle maintenance costs to the projected savings that should be anticipated based upon the results experienced during the pilot. These savings are a direct result of a reduction in the level of effort necessary to initiate an allowance update from 270 man-hours using the current paper-based process, to 20 man-hours using GI&SAS.

The estimated annual cost of performing 250 allowance updates under the current business process (without GI&SAS) is $4.7M. This figure is based upon a processing time of 270 man-hours per update, which is the historical observation, yielding an average cost per update of $18,900. Creating or updating a unit allowance with GI&SAS takes 20 man-hours, resulting in an average cost per update of $1400. Assuming sponsorship of the $150K for system enhancements is found quickly, implementation of the system would produce immediate payback and full recovery of development costs in FY02, providing a return on investment ratio of 4 to 1. This projection assumes that only one half of the normal volume of allowance updates (125) could be performed in FY02, given the lead-time necessary to implement the required system enhancements. Steady state annual productivity savings are estimated to be roughly $4.4M in the out-years.

Description	FY01	FY02*	FY03	FY04	FY05
Business Operations Costs for Unit GI&S Allowance Updates					
Current System					
# Unit Allowance Updates per Year		125	250	250	250
Average # Man-hours per Update		270	270	270	270
Total Man-hours Required		33,750	67,500	67,500	67,500
Average Hourly Pay Rate (Burdened)		$70	$70	$70	$70
Total Annual Cost		***$2,362,500***	***$4,725,000***	***$4,725,000***	***$4,725,000***
Average Labor Cost Per Unit Allowance Update		$18,900	$18,900	$18,900	$18,900
Maps & Charts System					
# Unit Allowance Updates per Year		125	250	250	250
Average # Man-hours per Update		20	20	20	20
Total Man-hours Required		2,500	5,000	5,000	5,000
Average Hourly Pay Rate (Burdened)		$70	$70	$70	$70
Total Annual Cost		***$175,000***	***$350,000***	***$350,000***	***$350,000***
Average Labor Cost Per Unit Allowance Update		$1,400	$1,400	$1,400	$1,400
Benefits/Savings					
Annual Gross Productivity Savings Using Maps & Charts		$2,187,500	$4,375,000	$4,375,000	$4,375,000
Cumulative Gross Productivity Savings Using Maps & Charts		$2,187,500	$6,562,500	$10,937,500	$15,312,500
Cumulative System Costs		$501,202	$551,202	$601,202	$651,202
Cumulative Total Net Maps & Charts Savings		***$1,686,298***	***$6,011,298***	***$10,336,298***	***$14,661,298***

*Note: New system cannot be implemented until midyear FY02 due to required programming modifications

Figure 10: Cost Benefit Analysis

7. Pilot Lessons Learned

During the course of Maps & Charts pilot planning, development, testing, and execution the following lessons learned were identified:

- Schedules that rely on network resources being of a similar configuration as the application moves from development, to testing, and into production should take steps to ensure that ***disparate network configurations*** do not threaten the established deadlines. The project team should identify network configuration differences as "high risk" in the project plan, and use network configuration "sniffer" software to document and verify network configurations in advance of the date required. This information should be made available to developers and testers. Sniffer results should be analyzed to identify potential configuration problems.

- Similar to the above, the ***server environments for development, testing, and production should mimic one another***. An audit should be performed in advance of need to verify that the installed software and environmental parameters of each system are similarly configured. Procedures should also be established within each environment for backups, database loads, software installs, and version control to ensure that the systems remain in synchronization.

- Time reserved in the test environment for GI&SAS was reduced due to an emergent testing requirement for another ("higher priority") CPF web development project. Sharing the limited time available jeopardized both projects' deadlines. The other project team didn't schedule the testing resources in advance, but bumped GI&SAS due to organizational priorities. A definitive ***procedure must be established within the IT***

organization for scheduling the necessary testing environment, this schedule, once established should be followed. To the extent possible, project plans should be built with enough slack to accommodate such unforeseen risks.

- ***Prototype users/testers were not identified to the project team in time*** to establish communication and ensure that they were technically ready (trained) at the start of the pilot evaluation period. "Grab the bull by the horns" and get those evaluators named, trained, and ready well in advance of pilot execution. Ensure that these users can connect to the necessary environment prior to evaluation start.

- ***Do not let the functional manager or personnel drive the technical solution***. The functional manager must clarify the requirements for the system without regard to the technology. The technical experts must determine the best solution within the constraints of the project. Communicate the roles of each team member clearly and early. The converse is also true. The technical staff develops a familiarity with the project and may attempt to drive the functional requirements. The project manager must ensure that communication is clear; and that team members have ownership, but understand what area they own.

- Having two people involved in system development, and one in charge of documentation made it extremely difficult to keep documents current and accurate on a daily, or even weekly basis. Single responsibility for documentation maintenance did not produce the value initially perceived. ***All members of the team should be responsible for updating the documentation*** so that the risk personnel turnover is minimized and changes in development requirements are not overlooked in the final documentation.

- ***ERWin was used effectively during the project*** to create and modify elements of the database. It enabled schedule timeline savings on numerous occasions when stored procedures needed to be created or modified quickly. On two occasions, major changes proposed by the functional lead might have been rejected for the sake of the schedule, had this tool not been available. Database design software, such as ERWin, builds a more efficient relational database and significantly reduces the time required to create, modify, and maintain a database.

- ***The AppZilla code generation tool produced a consistent look and feel for the application***. AppZilla will create list pages with document and email links, detailed record views and complex search pages, form entry pages with unlimited input fields, and dropdown selection boxes. The developer can choose ASP code designed for either authenticated or anonymous applications. Roles and permissions can be pre-configured to give granular security and administrative access to the generated application. AppZilla generates database creation scripts for SQL Server databases and development document templates. For this project, the code for menus and data validation was bug free in testing and saved development time and testing resources. Had this tool been able to support the use NT Authentication, the code generated for roles and permissions would also have saved development time and been bug free. AppZilla will continue to save testing resources and maintenance costs in the long term by generating standardized code, which significantly reduces the time required to test numerous variations of menus, data validation techniques, user roles, and permissions.

- Document type definitions (DTDs) and XSL (Extensible Stylesheet Language) style sheets were not required. XML (Extensible Markup Language) objects were used to

form recordset data in MS Excel format for viewing or downloading the six reports used in the prototype. XML was also used to input MS Excel data into a database table by using an inherent capability called a client-side data island object. This type of object is used to hold data while validation is being performed, and then displays the columns and rows back to the user in HTML format. A standard form post method was used when looping through and updating data on the server. ***XML was great in formatting data within a MS Excel spreadsheet***. This facilitated on-line viewing and the download of data for off-line evaluation. ***XML also solved the problem of uploading multiple records into the database.***

- The functional lead was well versed in the details of his business process and frequently described these processes with extreme granularity. The members of the technical team would collaborate following requirements gathering sessions in order to translate the information into database design or data presentation specifications. The team was successful to a large degree, but the intricate level of detail provided by the functional representative was sometimes lost for lack of total understanding, or implemented in a manner not envisioned by the user. As a result, the functional rep lost some confidence in the team and their efforts. When designing a database-centric application that doesn't have a user specific interface, ***it is recommended that requirements be elicited from at least two different subject matter experts***. Functional personnel must be able to envision and then effectively communicate each page and its business logic and data requirements.

- It is ***essential for the eBusiness Office to receive copies of invoices***, or other documentation, to ensure that all program funds are actually obligated in accordance with the approved spending plan.

- The ***eBusiness Office technical lead should physically visit the pilot organization during project startup, and again during the closeout phase***. VTCs (video teleconferences), email, and the telephone adequately accommodate routine project team communication. However, based upon the substantial knowledge exchange that took place during the project closeout visit to CPF for the Maps & Charts pilot, it is recommended that a site visit also be scheduled early in the planning phase of each funded project. This initial trip will establish a solid foundation and relationship between the two organizations, and foster a mutual understanding of the respective goals and objectives. The suggested duration of each visit is two days.

- When establishing project metrics, the team should ***concentrate on the three or four most meaningful measures of project success***. Attempting to track a wider range of key indicators reduces the likelihood that the data collected will prove to be insufficient to accurately assess pilot outcome. In addition, ***at least one of the selected metrics should directly support a financial analysis***, such as ROI.

8. Future Opportunities and Next Steps

The GI&SAS prototype fulfilled the expectations of both the eBusiness Office and CPF by attaining the established project goals and ultimately producing a viable and beneficial IT solution integrated with a reengineered business process. Despite this success, the GI&SAS system as it currently exists, cannot be implemented without further modification. These modifications were identified by potential end users of the application during execution of the

pilot, and highlight a range of features essential to support corporate business needs. Such deficiencies are to be expected when utilizing a rapid application development (RAD) methodology, and are in fact, an integral part of the development process.

8.1 Necessary System Enhancements

The pilot prototype clearly demonstrated the capability to quickly and efficiently manage Fleet allowances for GI&S products (e.g., maps and charts) utilizing a web-enabled business process. The system will provide CINCPACFLT and CINCLANTFLT with a management tool far superior to the current allowance system that is based on hardcopy lists promulgated as instructions. This process for the 21st century will be enable the Fleet to tailor the GI&S allowances of each ship as it prepares for deployment. One of the primary benefits of the pilot was that it allowed actual system users to view the product in action, and recommend modifications. These recommendations are attached as **Appendix G**. CPF estimates that it will take $150K and four months to implement all of these required changes.

In addition to the modifications suggested by the pilot participants, the eBusiness Office recommends that CPF explore a few supplementary enhancements. First, a robust electronic workflow capability should be built into the system. This would eliminate wait states between the various user roles, and permit automatic generation of system notifications (emails) to the individuals responsible for completing subsequent process tasks. Second, a website statistics gathering tool or capability should be integrated into GI&SAS to allow collection of metrics data and customer feedback in an automated fashion. Finally, as the system continues to evolve and mature, any augmented functionality that improves the interfaces between GI&SAS, other GIS tools, and the supply system should be considered for adoption. These are all long-term recommendations, and should not be considered as required for initial Navy-wide system implementation.

8.2 Action Plan

As of this date, GI&SAS remains essentially a work in progress. Having successfully demonstrated the prototype and validated the concept as being efficient, scalable, and exportable, the next step, and first priority should be to identify a funding sponsor for the required enhancements discussed above. This is the only option available to ensure migration of the system from a promising pilot to a fully leveraged enterprise-wide business solution. The following steps are presented as a high-level action plan to accomplish this migration.

1. Obtain funding support ($150K) for the remaining recommended changes/enhancements. Without it, the system cannot be implemented. The CPF Mapping, Charting & Geodesy Officer is in the process of briefing the results of the pilot up his chain of command in order to solicit internal funding support. Another possible option is to split the cost equally between CPF and CLF ($75K each).

2. In the event that the Fleets are unable to fund the follow-on development and lifecycle costs, it is recommended that the eBusiness Office and CPF team partner to seek OPNAV sponsorship from either the Oceanographer of the Navy (Code N096) or the logistics community (Code N4).

3. Upon receipt of funding, CPF will commence the development effort associated with the outstanding recommended changes and enhancements. This effort will take four months to complete.

4. Concurrent with development, the CPF functional lead will work with CLF and DLA to identify and resolve all business issues relating to implementation of the system Navy-wide. This includes final definition of common GRLs, publication of a joint CPF/CLF operating instruction, and formulation of an implementation schedule. The eBusiness Office will provide liaison with DLA as required.

5. DLA will implement any required system changes on their end.

6. CPF will develop help desk procedures and a life-cycle system support plan.

7. CPF, CLF, and DLA will conduct any required training.

8. Following the completion of development, CPF, CLF, and DLA will conduct joint systems testing.

9. CPF will conduct a follow-on user survey following the completion of system testing.

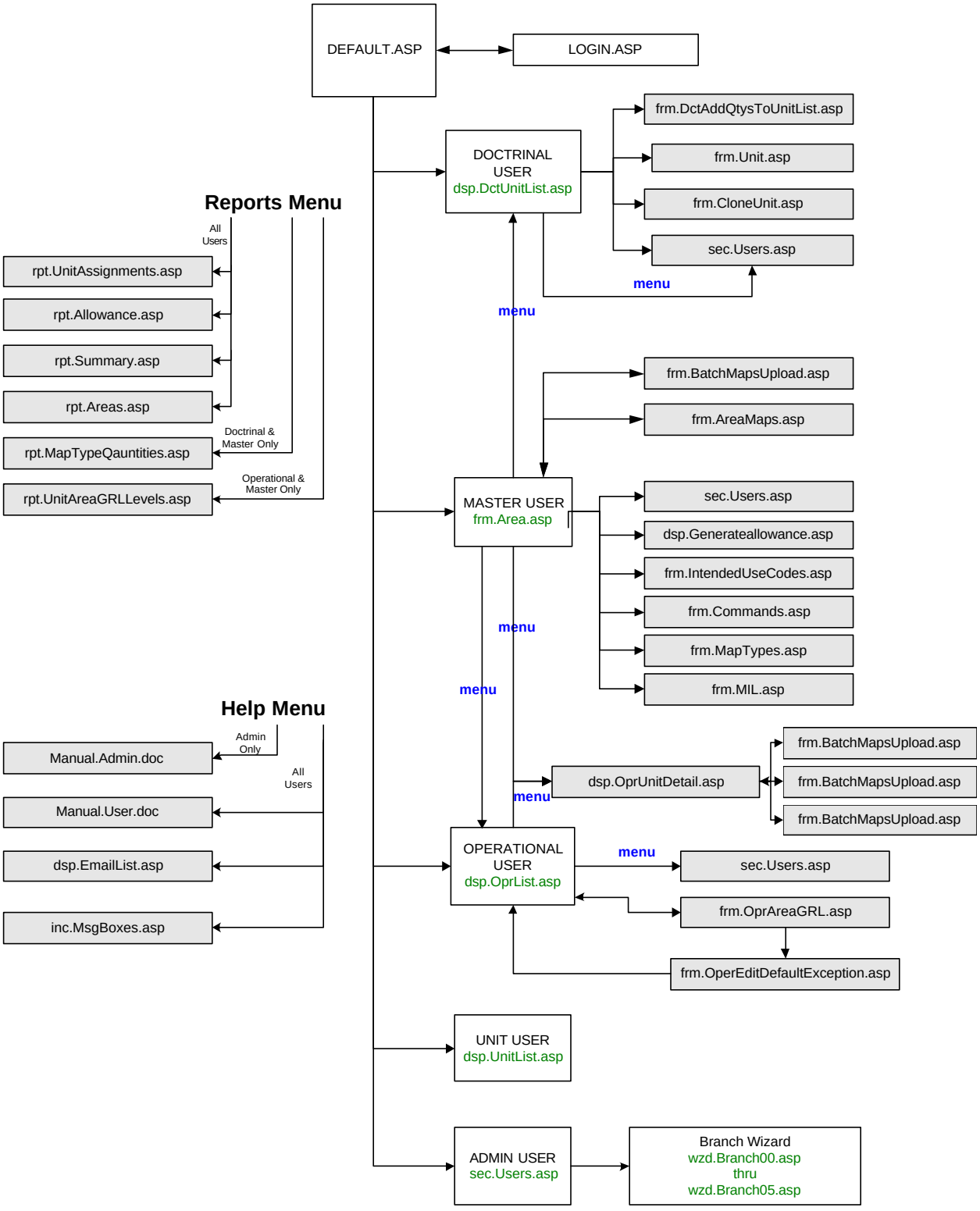
10. Following completion of the above steps, GI&SAS will be implemented as an enterprise production system.

11. The eBusiness Office and CPF team will work together with DLA to identify additional opportunities for implementation of GI&SAS by other DoD organizations. CPF has made a “demo” version of the GI&SAS system available through the Internet to aid in this effort. Instructions for accessing this secure website are shown in **Appendix H**.

Appendix A – Project Organizational Chart

<Appendix A removed>

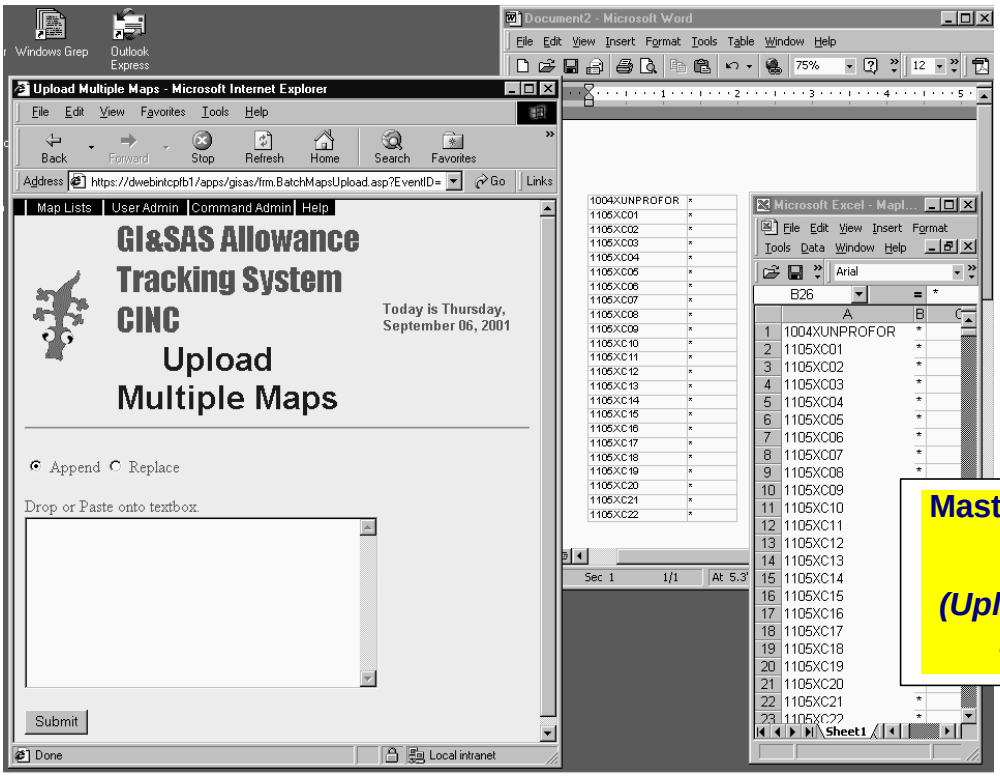
Appendix B – GI&SAS Website Map



Appendix C – GI&SAS Sample Screenshots

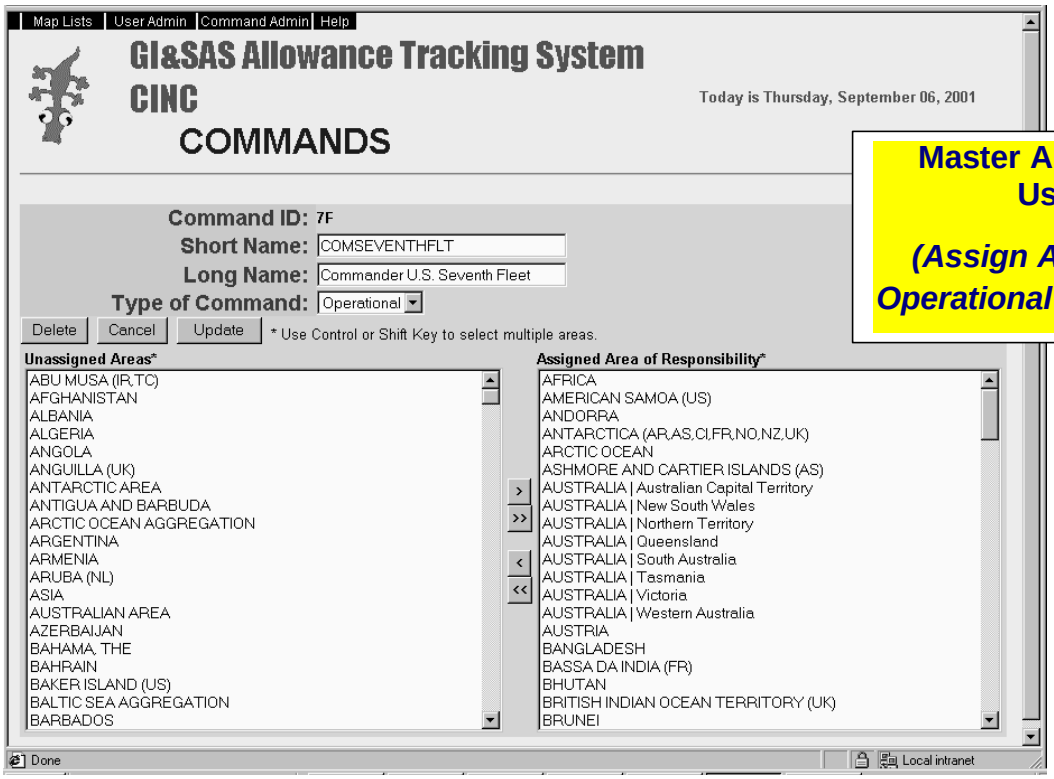
Master Allowance User's Homepage

(List of Areas)



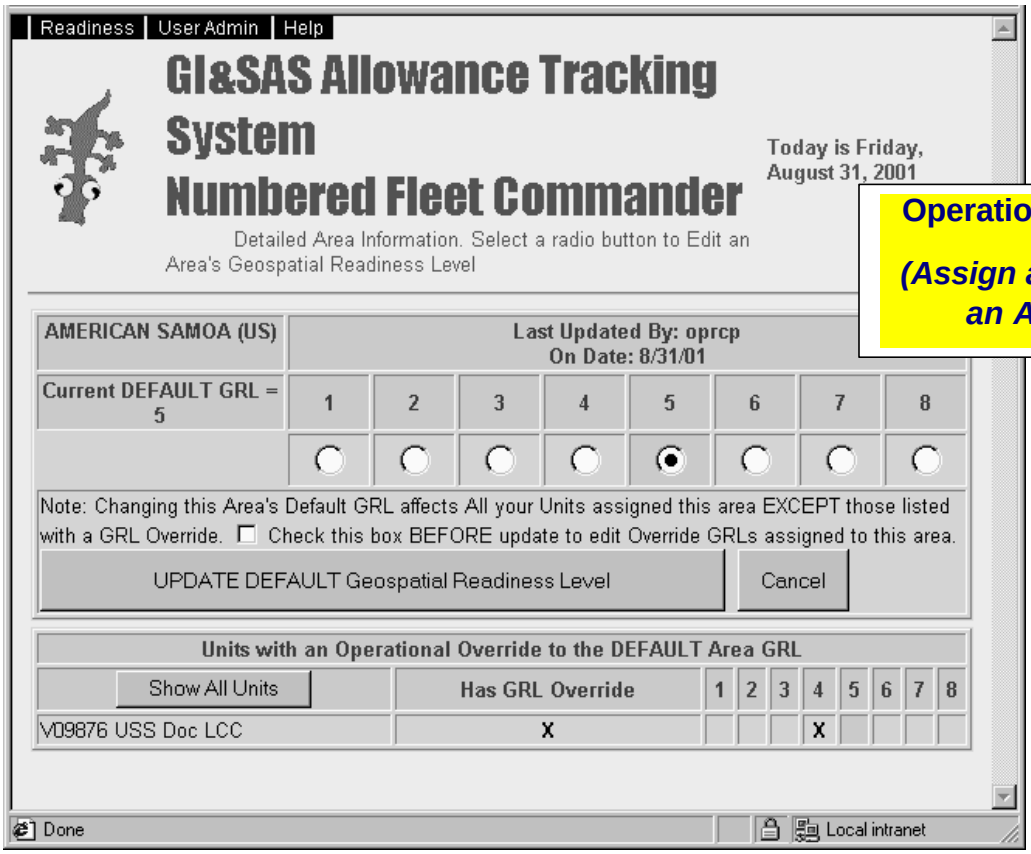
Master Allowance User

(Upload Maps to an Area)



Master Allowance User

(Assign AOR to an Operational Command)

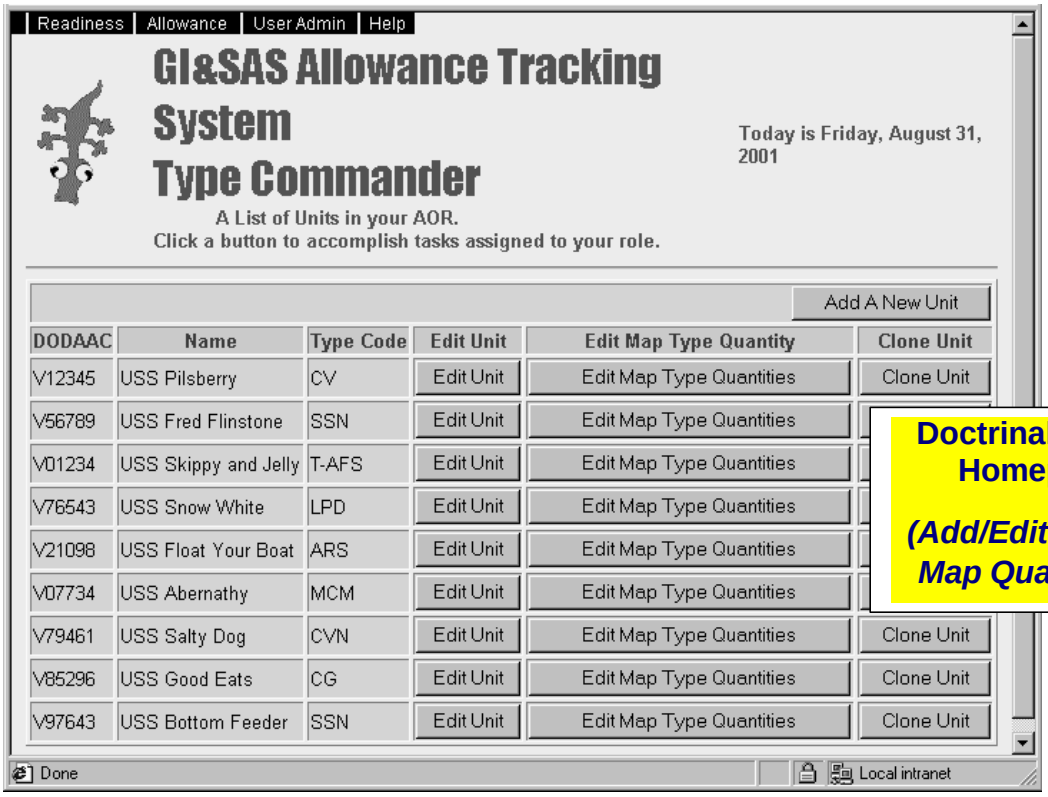


Operational User

(Assign a GRL to an Area)

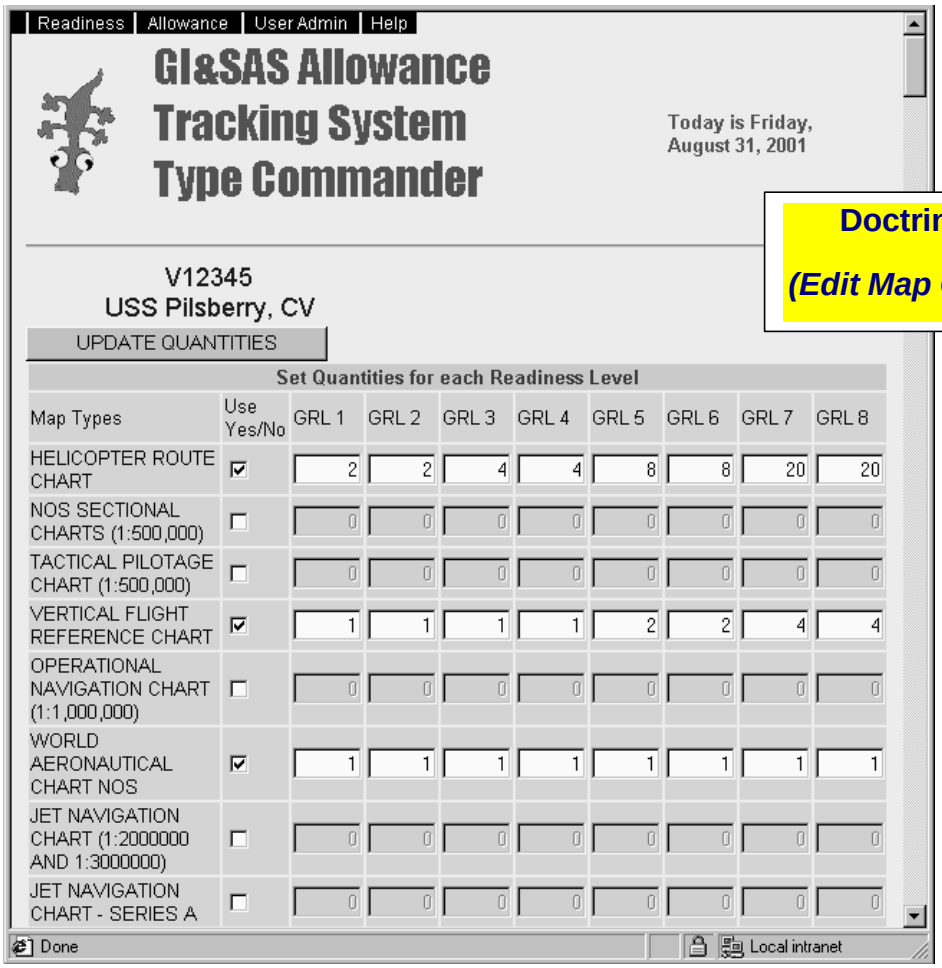
Operational User

(Assign Areas to a Unit)



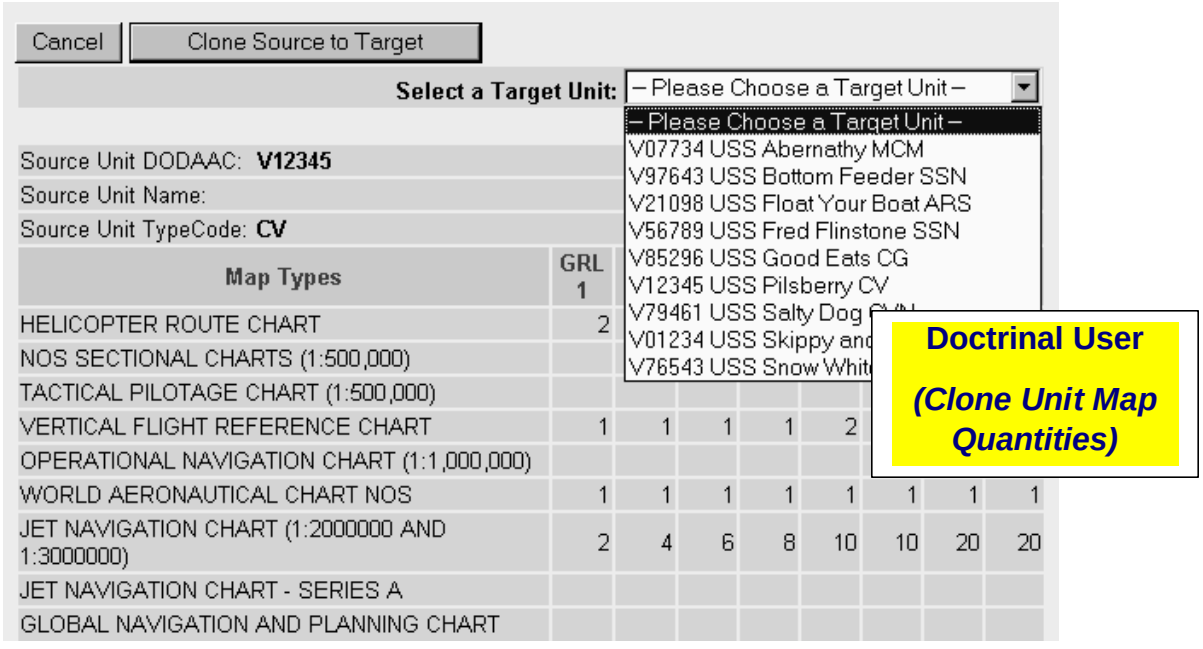
Doctrinal User's Homepage

(Add/Edit Units & Map Quantities)



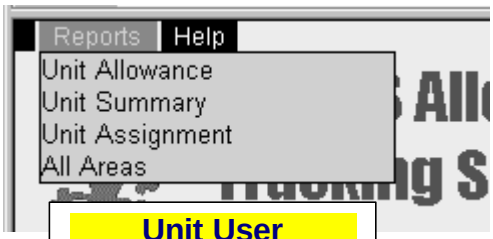
Doctrinal User

(Edit Map Quantities)



Doctrinal User

(Clone Unit Map Quantities)



Unit User

(View Reports)

A1 = DODAAC:

	A	B	C	D
1	**DODAAC:**	**V55566**		
2	**Name:**	**Good Ship Lollypop**		
3	**Type Code:**	**P-3**		
4				
5	**NRN**	**Quantity**		
6	1105XC02	5		
7	1105XC26	6		
8	1105XC27	6		
9	1106X01WT	6		
10	1106X02WT	6		
11	1106X03WT	5		
12	1106X11WT	7		
13	1106X13WT	5		
14	1107XWOR060WAOR	6		
15	1107XWOR135WAOR	7		
16	1144X3			
17	1145XWORLD			
18	1146X7SL01N	5		
19	1146X7SL01S	7		
20				

Good Ship Lollypop Allowance

Unit Allowance Report

A1 = DODAAC:

	A	B	C	D
1	**DODAAC:**	**V55566**		
2	**Name:**	**Good Ship Lollypop**		
3	**Type Code:**	**P-3**		
4				
5	**LineItem**	**Series**	**Description**	**Quantity**
6	3DB	1105	AREA OUTLINE MAPS (1:20,000,000)	17
7	3DB	1106	WORLD (1:5,000,000)	29
8	3DB	1107	WORLD (1:135,000,000 AND 1:60,000,000)	13
9	3DB	1144	WORLD (1:22,000,000)	6
10	3DB	1145	WORLD (1:30,000,000)	7
11	7BD	1146	INDEX BASES WITH AND WITHOUT SHEET LINES	12
12				
13			**Total Product Types**	6
14			**Total Number of Maps**	84
15				

Good Ship Lollypop Summary

Unit Summary Report

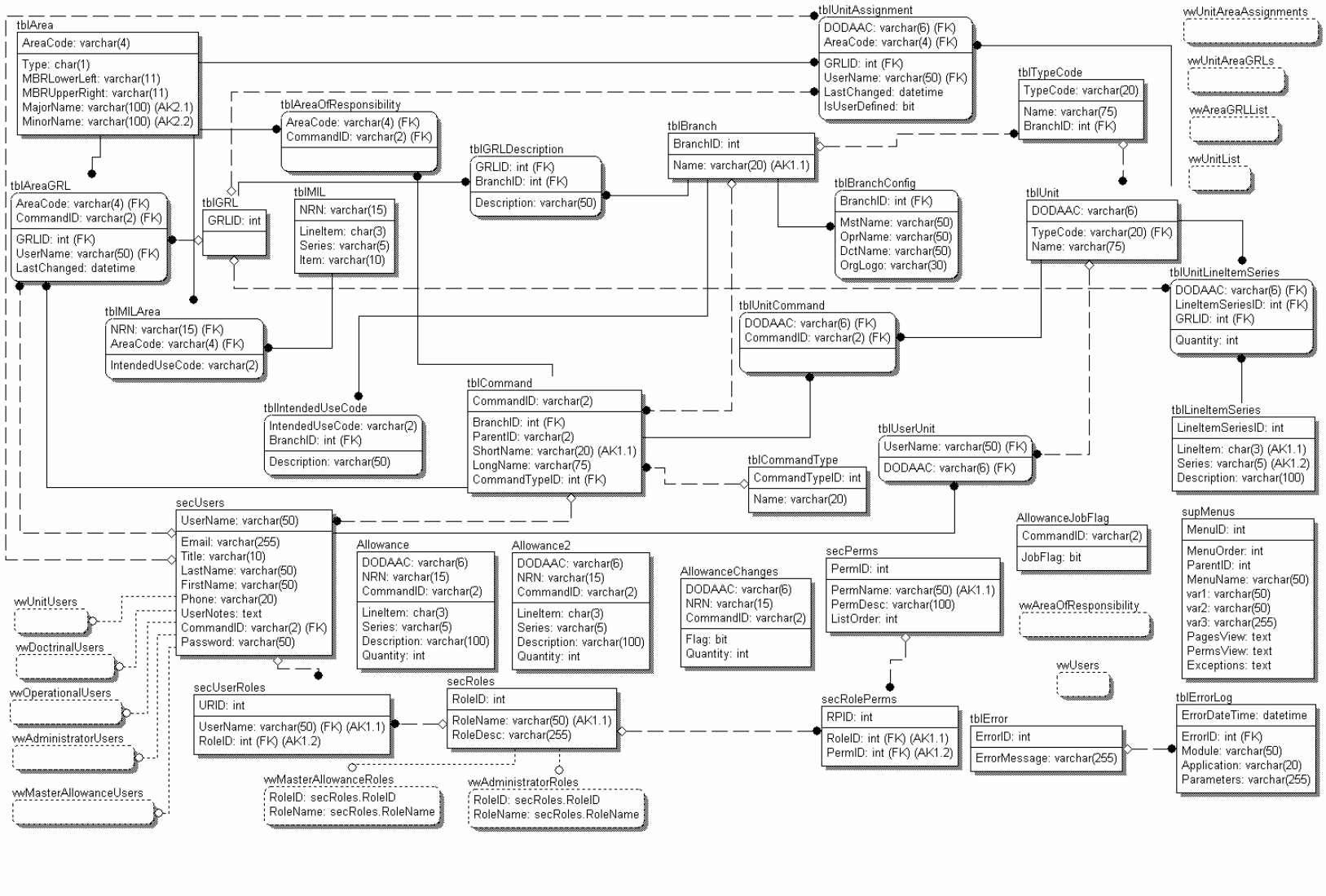
Unit Assignment Report

A1 = DODAAC:

	A	B	C	D
1	**DODAAC:**	**V55566**		
2	**Name:**	**Good Ship Lollypop**		
3	**Type Code:**	**P-3**		
4				
5	**Assigned**	**Area Code**	**Major Name**	**Minor Name**
6		AB00	ABU MUSA (IR,TC)	
7		AF00	AFGHANISTAN	
8		0F00	AFRICA	
9		AL00	ALBANIA	
10		AG00	ALGERIA	
11		AQ00	AMERICAN SAMOA (US)	
12		AN00	ANDORRA	
13		AO00	ANGOLA	
14		AV00	ANGUILLA (UK)	
15	7	0T00	ANTARCTIC AREA	
16		AY00	ANTARCTICA (AR,AS,CI,FR,NO,NZ,UK)	
17		AC00	ANTIGUA AND BARBUDA	
18		5A00	ARCTIC OCEAN	
19		0500	ARCTIC OCEAN AGGREGATION	
20		AR00	ARGENTINA	
21		AM00	ARMENIA	
22		AA00	ARUBA (NL)	
23		AT00	ASHMORE AND CARTIER ISLANDS (AS)	
24		0A00	ASIA	
25		AS01	AUSTRALIA	Australian Capital Territory
26		AS02	AUSTRALIA	New South Wales
27		AS03	AUSTRALIA	Northern Territory
28		AS04	AUSTRALIA	Queensland
29		AS05	AUSTRALIA	South Australia

Good Ship Lollypop Area Assignm

Appendix D – GI&SAS Database Diagram



Appendix E – DLA GI&SAS Requirements File Layout

Files should be in a fixed length ASCII text file, with no headers or blank lines, in the following format:

Character(s)	Description	Notes
1	Action code: (A)dd (D)elete (C)hange (S) Synchronization only	
2 through 7	Unit DODAAC Code	2-alpha 3 to 7 numeric
8 through 22	NIMA Reference Number (NRN)	blanks are filled with spaces
23 through 27	Quantity	Zero fills for blanks

Appendix F – Summary Results of Pilot User Survey

Question	Responses: Positive	Admin.	Minor	Major	Subst.	Critical	Significant Comments
1. The system, in general, met my needs for the user role I was assigned.	3	1	1				System works well, Dramatic improvement, System crashes when assigning AORs
2. The user role I was assigned, in general, had all of the features and functions for me to perform my tasks in managing fleet allowances.	1		2	1		1	Clone function didn't work, Very easy to use, Too many GRLs, System lacks intended use codes (IUCs)
3. I was able to access the system on the web and login with ease.	5						Works well on older PCs, Absolutely no problems accessing the system
4. The system's menus were easily accessed and usable.	3	1	1				Drop down menus could be larger, User names menu requires minor mod
5. User Maintenance for my role was easy to perform.	3	1	1				System crashes when > 12 AORs are highlighted, Better mechanism for maintaining MIF required
6. The page layouts for my role were clear and workable.	4		1				Too much space devoted to page headers & logo
7. The flow of the pages was fluid.	4		1				Flow was smooth, # clicks not excessive, Page flow is logical
8. The functionality for each page made sense and was intuitive.	5						The complete system functionality needs to be better covered in the Training Manual intro
9. The reports provide all the information needed to review and manage fleet allowances.	3		1	1			Develop graphical report capability, New data elements should be added, Need better labels
10. The communication process (e-mail) provided in the system facilitates communication between all parties involved in managing fleet allowances.	3		2				Use of email is good for providing alerts, I didn't see an email option on my interface, Need to be able to send to multiple recipients
11. The system structure will help to enhance operational readiness through streamlining the fleet allowance process.	3	1		1			It's difficult to get charts to a submarine, The system will dramatically improve the allowance process, Seems like it will work
12. The User Manual clearly explains tasks needed to utilize the application.	4		1				Typo an page 4 of Users Guide, User Guide addresses system, but not business process
13. The training adequately prepared you to use the system.	4	1					Training was adequate, All information was easily found in the Manual
% of Responses (Total per column / 65 Total Responses)	69%	8%	17%	5%	0%	1%	

Number of Respondents = 5

Positive – System is easy to use and functions well

Administrative – Nonfunctional modification needed (e.g. layout, spelling, grammar)

Minor – Impacts system ease of use

Number of Total Possible Responses = 65 (5 x 13)

Major – Impacts system efficiency or function but can be used to manage fleet allowances

Substantial – System makes managing fleet allowances difficult

Critical – System cannot be used to manage fleet allowances

Appendix G – List of Outstanding Changes and Enhancements

User Requested Changes Identified During the Pilot

No.	Description of CHANGE	Time Estimate (Hours)
GI&S-F1	Color. When a text item (e.g. NRN, Area Name) is selectable, the light blue font overlaid on a light green background is hard to read because the contrast is too low.	1
GI&S-F2	Font. When dealing with long list of NRNs, a fixed width font (e.g. Courier New) would be preferred over a proportional font (e.g. Arial).	1
GI&S-F3	Logo. The use of the branch logo at the top of each page consumes too much workspace. Display the logo only on the opening page and on each page display the name of the branch.	2
GI&S-F4	System Name. Make the name on all pages consistent as "GI&S Allowance System"	1
GI&S-F5	Page Names. The Page Names should be close to what is listed on the menu.	2
GI&S-F6	Command Name. Display Role of the user and command name for each page.	2
GI&S-F7	Cancel Button. Rename all "Cancel" Buttons which simply take you back to the previous page to "Back"	16
GI&S-F8	Grid Lines. Use grid lines or row color to help the user with lines of data in lists.	8
GI&S-F9	Date. Reformat date line on each page so that it is all on the same line on every page.	2
GI&S-F10	Command Name. The role name should be the user's Command Name instead of the generic role of Numbered Fleet Commander or Type Commander.	1
GI&S-F11	GRL Default. When a new area is created, automatically assign default the GRL level to "1"	1
GI&S-F12	Email. Set an e-mail mechanism on the login page for potential users to request access.	2
GI&S-F13	Security Warning. The login page should provide a basic security warning.	2

No.	Description of CHANGE	Time Estimate (Hours)
GI&S-F14	When adding a new area with the "New" button, Error 100012: Duplicate Primary Key displays. The new area is added despite the error message. If the area already exists, the same message is displayed and the duplicate area is not added to the database.	2
GI&S-F15	User Manual. Add additional information on the assignment of the four character Area Code and related data to the User Manual.	2
GI&S-F16	Edit Single Maps Screen. The list of NRNs should be auto-sorted in alphanumeric ascending order.	1
GI&S-F17	Intended Use Codes. Add the ability to attach multiple **IUC** to a single NRN.	100
GI&S-F18	Do not display the definition of the **IUC**.	2
GI&S-F19	"Add New Map" Page. When adding a new NRN with the "New" button, Error 100500: Duplicate NRN. Please enter a different NRN" displays. The new NRN is added despite the error message.	2
GI&S-F20	Intended Use Codes Page. On the list of **IUC**s the IUC as well as the definition of the IUC should be displayed.	2
GI&S-F21	Intended Use Codes Page. When adding a new **IUC** with the "New' button, Error 100012: Duplicate Primary Key" displays. The new IUC is added despite the error message.	2
GI&S-F22	Change column label from "LineItemSeries ID" to "ID".	1
GI&S-F23	Change series set to "ALL: to "*". This will be consistent with the use of the "*" in the IUC list to mean all.	1
GI&S-F24	Add a column to the right of the Series column to display the **IUCs**.	3
GI&S-F25	Sort the Map Types based on Line Item, Series, and IUC.	2
GI&S-F26	When adding a new Map Type with the "New" button, Error 1000013: Unknown error - not in Error table" displays. The new Map Type was added despite the error message.	2
GI&S-F27	Automatically capitalize all alpha characters input into the LineItem or Series fields.	1
GI&S-F28	Automatically capitalize all alpha characters input into the NRN, LineItem, Series, and Item fields.	1
GI&S-F29	Create validation checks for the matching LineItem and Series to combination found in the Map Type List. Series and Item should match NRN.	16

No.	Description of CHANGE	Time Estimate (Hours)
GI&S-F30	Text. Change the use of the AOR, update directions, and change page name.	1
GI&S-F31	Repetition of action buttons are redundant.	0
GI&S-F32	When adding a new unit with the "Add" button, Error 100012: Duplicate Primary Key." displays. The new unit is added despite the error message.	2
GI&S-F33	From the "Edit Map Type Quantities" button on the Unit Page, the display page needs a page title added.	1
GI&S-F34	Present the unit ID data on a single line.	1
GI&S-F35	Change direction to read "Select Map Type to use and set quantities for each Geospatial Readiness Level."	1
GI&S-F36	Delete "Yes/No" from Use column.	1
GI&S-F37	Quantities. Add validity checking to insure the quantity for a GRL is equal to or larger than the quantity for the next lower GRL and to make sure the user did not insert all zeros.	20
GI&S-F38	Add a cancel button to this page.	1
GI&S-F39	Text. Change label from "Select Target Unit" to "Target Unit" and change guidance in the combo box to "Select a Target Unit"	1
GI&S-F40	Cloning. Limit cloning to Map Type and Quantity data and remove the cloning of Command Assignment.	80
GI&S-F41	Change warning to read "Cloning will ERASE all existing Map Type and Quantity Data in the TARGET and replace it with the data from the source."	1
GI&S-F42	Readiness Menu - Assign areas to Unit. Add a page name.	1
GI&S-F43	Readiness Menu - Assign areas to Unit. Edit Areas button. Change header from "Type Commander" to Numbered Fleet Commander."	1
GI&S-F44	Area Assignments. Encountered area assignments for the target unit was reset to original status when setting GRL Overrides.	40
GI&S-F45	Readiness Menu - Assign areas to Unit. From the GRL Override Button the page need a page name.	1

No.	Description of CHANGE	Time Estimate (Hours)
GI&S-F46	Change the directions to "Select a Checkbox to override the default GRL for the area. Select a Radio Button to set the Unit's GRL for the area. Grey boxes identify the default GRL for the area."	1
GI&S-F47	Change column label "Default GRL and Assigned Areas" to "Assigned Areas" and change column label "User Defined GRL" to "Unit Specific GRL"	1
GI&S-F48	Change page name to "Clone Area Assignments"	1
GI&S-F49	Change label "Select a Target Unit" to "Target Unit" and change text in the combo box to "Select a target unit"	1
GI&S-F50	Move target combo box to left side of page and placed above the buttons and below "Coning will copy the Area Assignments including any GRL Overrides from the Source Unit into the Target Unit." Change the text for the clone button to read "Source >> Target"	4
GI&S-F51	Limit cloning ability to areas in the AOR of the Operation User.	8
GI&S-F52	Change warning to read "Cloning will ERASE all existing Map Type and Quantity Data in the TARGET and replace it with the data from the source."	1
GI&S-F53	Command Admin Menu - Edit Commands option. List of commands should only use the short or long name, not both.	1
GI&S-F54	Reports Menu - Unit Allowance option. Add a button to return to the Allowance Reports criteria page.	2
GI&S-F55	Reports Menu - Unit Summary option. Add a button to return to the Summary Reports criteria page.	2
GI&S-F56	Reports Menu - Unit Assignment option. Add a button to return to the Unit Assignment Reports criteria page.	2
GI&S-F57	Reports Menu - Unit Assignment option. Change label for first column from "Assigned" to "Assigned GRL"	1
GI&S-F58	Reports Menu - Unit Assignment option. Change report and page names to "Single Unit Assignments.	1
GI&S-F59	Reports Menu - Unit Area GRL Levels option. Change report and page names to "Multiple Unit Assignments"	1
GI&S-F60	Reports Menu - Unit Area GRL Levels option. Use the Unit Name instead of the DODAAC.	1

No.	Description of CHANGE	Time Estimate (Hours)
GI&S-F61	Reports Menu - Unit Area GRL Levels option. Add columns for Area Major and Minor Names.	3
GI&S-F62	Reports Menu - Unit Map Type Quantities option. Add columns for Line Item, Series, and IUC.	8
GI&S-F63	Help Menu - Command E-mail List option. Add page name.	1
GI&S-F64	Help Menu - Command E-mail List option. Include e-mail address for the system administrator.	2
*** TOTAL**		**376.00**

** This estimate is for programming only. Testing, project management, and other overhead is additional cost.*

Enhancements Identified During the Pilot

No.	Priority	Page	Description of ENHANCEMENT	Time Estimate (Hours)
GI&SE1	6	Clone a Unit	Layout. Move target combo box to left side of the page and place above the buttons and below the text that reads "Cloning will copy the Map Type and quantity data from the Source Unit into the Target Unit." Also move the cancel button to the right of the clone button. Change the text on the clone button to read "Source >> Target"	10
GI&SE2	5	see GI&SF43	Text. Rewrite direction text.	3
GI&SE3	2	Clone a Unit	Add validity checking to ensure the Source Unit Type Code matches the Target Unit Type Code. Add an option to cancel or continue with the cloning.	32
GI&SE4	3		Add a new report that lists the NRN and IUC for a sing Map List/Area.	16
GI&SE5	7		Help Menu - About This Application. Remove.	1
GI&SE6	3	General	Add user role which allows access to the map lists (areas, types, IUC and Allowance generation) only for read, write, and execute.	40
GI&SE7	2	General	Add the ability to the Mst User Role to simulate any of the other command users within the Mst User's AOR.	80
GI&SE8	4	Area	Maps List Menu - Edit Area option. Add a drop down list for Type with definitions for the type instead of the Type Code itself.	24

No.	Priority	Page	Description of ENHANCEMENT	Time Estimate (Hours)
GI&SE9	5	Area	Maps List Menu - Edit Area option. Add textual guidance for the field of MBR Lower Left and MBR Upper Right fields (field definitions and add to the User Manual.	16
GI&SE10	1	Master Inventory List	Automate the Master Inventory list by using a file from DLA as an authoritative data source.	80
GI&SE11	3	Unit	Readiness Menu - View Unit Info option - Add A New Unit Button. Change screen flow so that when a new unit is added the Edit Unit page automatically opens.	16
GI&SE12	2	Unit	After adding a new unit, the edit Unit page should automatically open to enter command assignments and unit users.	8
GI&SE13	6	Unit	On the edit Unit page, change the layout to bring a greater definition between the three different sections or functions displayed on the page.	24
GI&SE14	2	see GI&SF33	For each Map Type, provide basic information about that specific map type and guidance for using the product.	24
GI&SE15	3	see GI&SF42	Create separate column to display the Type Code and label it "Type"	16
GI&SE16	5	see GI&SF42	Enhance the guidance text to be more useful.	10
GI&SE17	5		Readiness Menu - Assign Area GRL option. Assign a page name.	26
GI&SE18	4	see GI&SE17	Default every area to have a GRL level of "1".	16
GI&SE19	6	see GI&SE17	Make consistent format and labeling for each page that displays a list of Area Names.	8
GI&SE20	6	see GI&SE17	Change the format for displaying the GRL level to the GRL level number - definition.	2
GI&SE21	3	User Admin	create separate fields for commercial and DSN phone numbers, class and unclass email addresses, and a middle initial.	10
GI&SE22	3	User Admin	Reorder the fields to first name, middle initial, last name, phone, DSN, Unclass email, class email, User name, password, password validation, notes.	22
GI&SE23	5	User Admin	Insert guidance to enter an e-mail address for the military only.	2
GI&SE24	3	User Admin	Change the formation of the phone field to allow for foreign commercial telephone numbers, parenthesis, and dashes.	8

No.	Priority	Page	Description of ENHANCEMENT	Time Estimate (Hours)
GI&SE25	3	Allowance	Add to the metadata for the master inventory list, edition, edition date, stock status, and classification.	16
GI&SE26	3	Summary Report	Add a column to the Summary Report for the total number of individual NRN in a series and label it "Lines"	4
GI&SE27	4		Generate Allowance Menu - Generate Allowance File option. Change the cycle to allow the Mst User to schedule the day and time the report should run and show that schedule on the page which currently displays the text that the job has been scheduled.	16
GI&SE28	5	see GI&SE27	Display the last day and time of the allowance generation along with the length of time taken to run the file.	4
GI&SE29	4	see GI&SE27	Add a button on the page to allow the Mst to download the allowance generation file output to a local drive.	2
GI&SE30	4		Help Menu - View Users Manual option. Provide an option to download the manual.	1
GI&SE31	4		Help Menu - View Administrators Manual option. Provide an option to download the manual.	1
GI&SE32	2		Add a graphical interface for area assignments with color-coding of GRLs to the NIMA RAS system.	2
GI&SE33	2		Create a button for the Mst to easily see what command an area is assigned to instead of searching for an area through all of the commands.	4
GI&SE34	3		Can't delete Opr user (ERROR 100015: Unable to delete row). Change so that any user can be deleted with all of the associated "unlinking of information" being done automatically in the background.	4
*** TOTAL**				**548.00**

** This estimate is for programming only. Testing, project management, and other overhead is additional cost.*

Appendix H – Instructions for Accessing the GI&SAS Prototype

1. Type the URL https://secure.phi.cpf.navy.mil into the address bar of the web browser and press <Enter> on the keyboard.
2. Read the site information and warning completely. When done click on the gray < Accept Conditions and Enter > button on the screen.
3. Click on the blue Register hyperlink to create an account.
4. Following the Rules listed at the top of the web page, complete the registration form.
5. Click on the gray < Submit > button at the bottom of the screen.
6. Wait 15 minutes for the request to process.
7. On the sign-in screen, input your newly created Username and Password.
8. Click on the gray < Login > button on the screen.
9. Click on the blue Request Access hyperlink on the left side of the screen.
10. Click on the box to the left of the GI&S Allowance System name.
11. Click on the gray < Submit Request(s) > button at the bottom left of the screen.
12. Please wait 24 – 48 hours for the Content Manager to approve and process your request.
13. Repeat steps 1, 2, 7, and 8.
14. The hyperlink GI & S Allowance System will show under the Content Access heading when the access request has been processed.
15. Click on the blue GI & S Allowance System hyperlink to access the prototype system.
16. Follow the instructions on the GI&SAS system sign-in screen.

Appendix I – List of Acronyms

AOR – Area of Responsibility
ASP – Active Server Page
CINC – Commander in Chief
CLF – Commander in Chief, Atlantic Fleet (CINCLANTFLT)
COSAL – Coordinated Shipboard Allowance List
COTS – Commercial Off The Shelf
CPF - Commander in Chief, Pacific Fleet (CINCPACFLT)
DHTML – Dynamic Hypertext Markup Language
DLA – Defense Logistics Agency
DoD – Department of Defense
DODAAC – Department of Defense Activity Address Code
DoN – Department of the Navy
DSC – Defense Supply Center
DTD – Data Type Definition
FTP – File Transfer Protocol
GI&S – Geospatial Information and Services
GI&SAS - Geospatial Information and Services Allowance System
GRL – Geospatial Readiness Level
HTML - Hypertext Markup Language
ICP – Inventory Control Point
IUC – Intended Use Code
MAU – Master Allowance User
NFC – Numbered Fleet Commander
NIMA – National Imagery and Mapping Agency
NIPRNET - Unclassified but sensitive (N-level) Internet Protocol Router Network
NMCI – Navy Marine Corps Intranet
NRN – NIMA Reference Number
OA – Opportunity Analysis
RAD – Rapid Application Development
ROI – Return on Investment
SIPRNET – Secret Internet Protocol Router Network
SQL – Structured Query Language
TYCOM – Type Commander
VTC – Video Teleconference
WEN – Web Enabled Navy
XML – Extensible Markup Language
XSL - Extensible Stylesheet Language